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Human brain recordings provide highly sought insights into cause of Parkinson's disease

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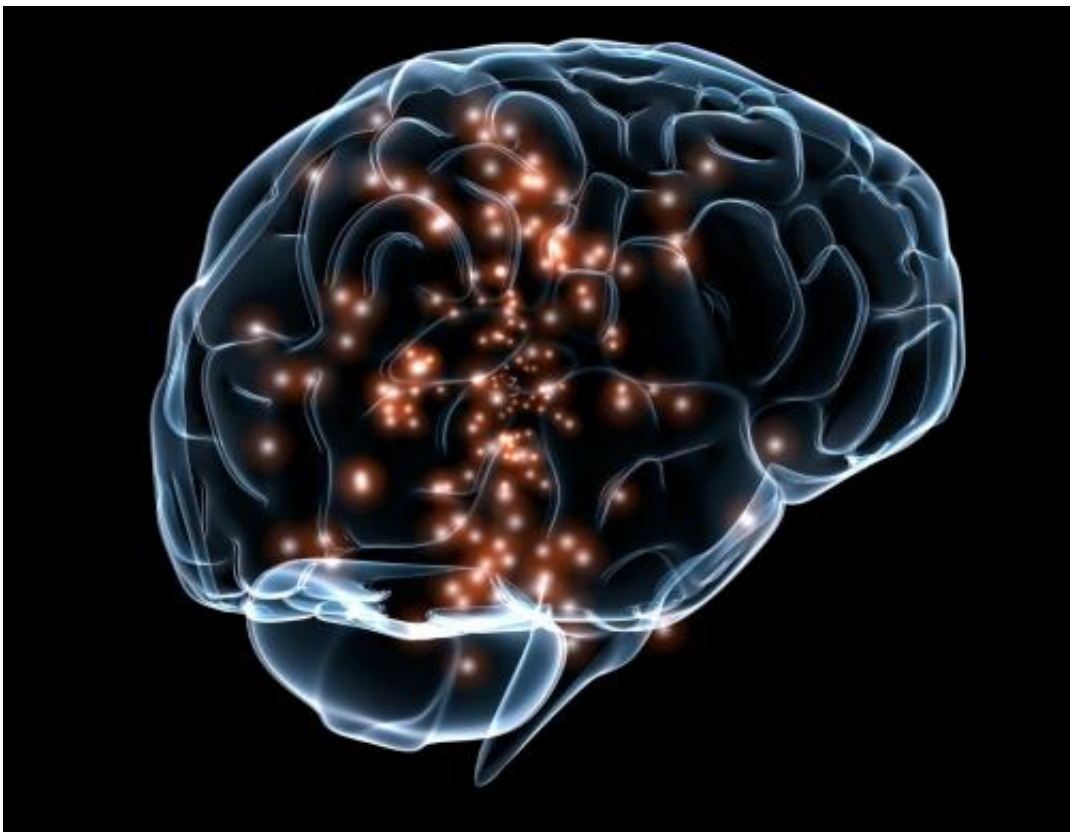

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Researchers at Yerkes National Primate Research Center, Emory University, are the first to systematically record neural activity in the human striatum, a deep brain structure that plays a major role in

cognitive and motor function. These two functions are compromised in Parkinson's disease (PD), which makes the neuron-firing abnormalities the study results revealed key to better understanding the pathophysiology of PD and, ultimately, developing better treatments and preventions. The study findings are reported in the current online issue of the *Proceedings of the National Academy of Sciences*.

Nearly one million people in the U.S. are living with PD, a chronic and progressive neurodegenerative disorder.

In this study, the Yerkes researchers compared striatal recordings across people who have PD and other neurological disorders (dystonia and essential tremor) with correlative findings in nonhuman primates. The researchers undertook a rigorous, several-year selection process to find the right patients undergoing surgical deep brain stimulation treatment in order to obtain sufficient recordings. The study was further supported by the researchers comparing data obtained in nonhuman primates, which provided critical animal controls and disease models.

"We found profound changes in the activity of striatal projection neurons in patients with PD, which highlighted the striatal role in circuit dysfunction" says Stella Papa, MD, lead researcher for this study. According to Dr. Papa, until now, basal ganglia circuit models of PD have been based on presumptive changes in the outputs of the dopamine-depleted striatum that were never found in human studies. "The data we are providing in this new study have long been due and weigh significantly in the interpretation of striatal mechanisms in basal ganglia circuits and their contribution to the pathophysiology of PD," she continues.

The researchers next steps are to continue investigating the physiological and molecular mechanisms participating in the abnormal firing of striatal projection neurons in PD. Understanding these mechanisms is key to

developing target-specific treatments to improve the lives of people who have PD.

Provided by Emory University